

# Red Hat and Couchbase Deliver an Optimized Solution for Modern Apps




Applications codify and support the processes that make up a digital business. Management requires highly dynamic modern apps that deliver insight into where the business is going. These stand in stark contrast to backward-looking legacy apps that merely keep score. Modern apps must be agile, be capable of being iterated quickly, ensure that data is never locked away and support much higher levels of efficiency. Efficiency must include optimizing the use of IT infrastructure resources and scarce IT talent. The combination of Red Hat® and Couchbase contributes to improved operating metrics such as application performance, fluid accessibility of data assets across multiple apps and operational efficiency. And all of this can be done at speed. One important step that will enable DevOps to meet the demands of management teams is to implement leading-edge development technologies and improved operational tools. This is the same goal that drives Red Hat and Couchbase's collaboration. By combining the leading container platform, a world-class database and the Couchbase Autonomous Operator® framework, which enhances operation of these apps, this joint effort gives organizations a way to move forward with confidence. The solution supports both the development and use of next-generation apps with automated Operators that reduce demand on IT resources, delivering more reliable and resilient apps and supporting the ability to run workloads anywhere.

### **Red Hat OpenShift and Couchbase deliver for modern apps**

Red Hat® OpenShift® Container Platform® and Couchbase are working together to deliver joint customers an agile and efficient framework for both the development and operation of applications that are reliable enough for mission-critical workloads and have the scalability necessary to meet changing demands. It is an ideal combination for modern apps that support workloads such as big data, mobile and IoT, as well as web- and cloud-based apps and other demanding next-generation applications. The joint solution is well aligned with a key tenet of DevOps: reusability, or leveraging existing code and assets to speed the development of new apps. To start, Red Hat OpenShift is a leading container platform. Containers make it very easy to reuse code or microapps, a characteristic that has contributed to the dramatic increase in container use. Organizations are turning to containers to create code once and run it anywhere, ensure scalability and benefit from the efficiency of this technology. According to Statista, 30% of organizations are running containers in production and more than 60% are experimenting with them or researching them. Red Hat OpenShift is a leading container platform recognized by analysts and used by customers around the world for a variety of industries and use cases.

Another important point of leverage is the ability of Couchbase, in conjunction with Red Hat OpenShift, to provide DevOps teams with a fluid data layer that allows any data in the database to be used in any app. This is a critically important capability: According to a Couchbase survey, 72% of data architects in large organizations said legacy databases limit their organization's ability to complete digital transformation projects. Couchbase provides an optimal solution for allowing developers to use data anywhere.





Another way the joint offering delivers advantage is by eliminating infrastructure-as-a-service vendor lock-in. This is vitally important, because new capabilities, tools and cloud services are coming to market almost daily. Having the option to use whatever technology or product works best is essential to supporting modern apps, and using Red Hat OpenShift to provide a common application platform gives DevOps teams the capabilities they need. This includes the ability to use multiple options for cloud, but it also allows for a reversion to on-premises infrastructure if data governance, privacy or other considerations require that to happen. Having all options open for any workload ensures organizations can make the optimal choice.

## How the Couchbase Autonomous Operator for Red Hat OpenShift supports an optimal environment for modern apps

The Couchbase Autonomous Operator simplifies the process of deploying, managing and maintaining Couchbase on the Red Hat OpenShift Container Platform. This powerful tool allows a developer or administrator to deploy Couchbase server clusters with a single command and provides full management for all of these instances. The joint solution makes it easy to leverage the capabilities of Couchbase into Red Hat OpenShift, allowing containerized apps to utilize Couchbase NoSQL. The integration of the two products is seamless, eliminating the need to work in two distinct environments.

Several important features supported by the joint offering enable organizations to move to more modern apps. For DevOps teams, these features will make it easier to complete projects and ensure they have more functionality in the first release. They include:

- **Centralized configuration management:** Managing configurations can often be a time-consuming task, but one that is necessary. It is possible to manage configurations centrally and more efficiently with Red Hat OpenShift. Changes made there ripple through and are noted by the Couchbase Operator, and then the Operator will take action to match or update the target cluster with the new or updated configuration.
- **Support for multiple, geographically distinct data centers:** As the issue of application performance takes on more prominence, it is often necessary to move apps from one data center to another that is closer to the users of that app or data. This capability also supports enhanced reliability and disaster recovery, since the IT organization can move the workload to an operating data center if the primary data center experiences an outage.
- **Automation of cluster provisioning:** Another task that often falls on operations is cluster provisioning. Like configuration management, it is an important activity, but one that provides little true value. It is now much simpler to deploy a Couchbase cluster by using the Couchbase Operator. All the team has to do is create an instance of the Kubernetes Custom Resource for a Couchbase cluster, and the Operator will set up the cluster to meet the specifications necessary for the app.





- **Automated recovery capability:** Modern apps must deliver very high levels of availability and resiliency. Automating recovery from failures of nodes helps ensure this. The Red Hat-Couchbase solution provides fully automated recovery through the Couchbase Operator, reducing the impact of any outage and reducing the need for human intervention. Red Hat OpenShift also helps with recovery by replacing failed nodes automatically. There are multiple options for bringing the cluster back up to capacity, depending on what will provide the best outcome in a specific scenario.
- **Persistent storage:** Using the Couchbase Operator, it is now easier to properly manage storage and improve consistency. IT teams can also improve data availability to other apps or workloads. In addition, the product allows admins to define persistent network-attached storage for each Couchbase instance. This makes it easier to recover pods even if the node they are running on is no longer available.
- **Enhanced scalability:** A hallmark of modern applications is built-in scalability to ensure that performance is maintained regardless of changes in the workload. Red Hat OpenShift with Couchbase supports automatic cluster scaling, both for increasing and decreasing loads. Scaling the number of Couchbase Server pods will trigger Red Hat OpenShift to scale the number of nodes when capacity is reached. When loads are reduced, the same automated process is done in reverse.
- **Improved rack and zone awareness:** Using the Couchbase Operator, admins can document availability zones in the data center and use the Operator to ensure that nodes in the cluster are deployed equally across each zone.
- **Enhanced supportability:** The Red Hat OpenShift and Couchbase Operator solution is highly reliable. If an outage or problem occurs, the “cbopinfo” tool collects relevant data about the Couchbase environment, supporting faster remediation of any issues and rapid recovery. The tool simplifies and speeds up problem identification, reducing the impact of an outage. Such recovery capabilities are in addition to new features that support enterprise-grade availability.

Access to the Couchbase Operator for Red Hat OpenShift is straightforward: IT professionals can download the software from the [Red Hat Marketplace](#) and start using it immediately. The Marketplace also has other tools and software to help developers get more done.



## Extended architectures with Couchbase Capella

Many organizations have adopted Red Hat OpenShift and Couchbase Autonomous Operator because the combined technologies allow them to build highly available applications and services that take advantage of multiple cloud environments in order to withstand failures, scale dynamically, and meet the demands of modern applications. With Couchbase Capella, organizations can extend these architectures to broaden and diversify their deployment options and footprint. Couchbase Capella is the fully managed deployment of Couchbase, providing all the power of Couchbase Server as a database-as-a-service (DBaaS) available on AWS, Azure and GCP. It provides the ability to replicate data between database clusters leveraging Cross Data Center Replication (XDCR), a feature of Couchbase available in both self-managed deployments as well as the Capella DBaaS. This capability enables extended architectures where self-managed deployments of Couchbase running on Red Hat OpenShift can replicate data to Couchbase Capella.

This extended architecture expands the options for hybrid and multi-cloud deployments, allowing organizations to meet any regional coverage or availability requirements. It also enables edge computing architectures, where Red Hat OpenShift deployments running Couchbase at the edge can replicate data to Capella in the cloud.

Capella can also enable a microservices architecture, where data microservices running on Red Hat OpenShift can leverage Capella as the backend database that feeds the services.

## Considerations for using Red Hat OpenShift and Couchbase

As you embark on the use of Couchbase on Red Hat OpenShift, consider these three factors to enhance your efforts:

### 1. Local persistent storage will work well with Couchbase to improve performance.

It is possible to achieve a five-fold reduction in latency to the disk, and this raises performance levels to near parity with a bare-metal implementation. This performance gain can be vitally important in data-intensive applications or those that require the use of larger data sets. And this solution improves reliability in the event of a disk failure; since Couchbase always creates replicas of the data on other nodes, the possibility of data loss is eliminated.



**2. Application metrics are available from the start.** The old saying “If you can’t measure it, you can’t manage it” applies to container platforms and modern apps. Having actionable metrics is essential for efficient operations. It is possible to centralize the metrics for your Red Hat OpenShift and Couchbase implementation using Prometheus and Grafana. Using Capella, metrics are available in the Capella UI, via API call, and with a Prometheus endpoint. With self-managed Couchbase, metrics can be seamlessly exported to Prometheus. Implementing this capability at the outset will provide both development and operations teams with the insight necessary to ensure that modern apps can always perform at the necessary levels and make it easier to optimize the use of underlying hardware.

**3. Lifecycle management simplifies operations.** Among the important tools provided by the Red Hat OpenShift and Couchbase Operator framework, the Operator Lifecycle Manager stands out. It simplifies the installation, updating and management of the lifecycle of all operators. With this technology, it is now easy to select the update policies (automatic or manual) that best meet the requirements of the application or use case. Implementing lifecycle management after the fact is often more difficult and can get in the way of application updates or enhancements that should be the focus revisions to the original code.

## Key takeaways

The sun has set on legacy applications and their development. Organizations need a new approach that includes an optimized environment for creating and operating modern apps. It is essential that this new solution provides as much support for operations as it does for development. There is a core set of requirements that must be delivered: agility, speed, automation, data leverage, reliability and performance. As mission-critical workloads move from legacy systems, it is vital to use a platform that can deliver.

These requirements and customer needs have infused the joint efforts of Red Hat and Couchbase. The combination of Red Hat OpenShift and Couchbase provides IT teams with a solution that can take them into the future. Most importantly, it provides the functionality necessary for enterprise-class apps. For more information on how the Red Hat OpenShift Container Platform and Couchbase can help you move more quickly to a modern app environment, [click here](#).





Modern customer experiences need a flexible database platform that can power applications spanning from cloud to edge and everything in between. Couchbase's mission is to simplify how developers and architects develop, deploy and consume modern applications wherever they are. We have reimaged the database with our fast, flexible and affordable cloud database platform Capella, allowing organizations to quickly build applications that deliver premium experiences to their customers—all with best-in-class price performance. More than 30% of the Fortune 100 trust Couchbase to power their modern applications.

For more information, visit [www.couchbase.com](http://www.couchbase.com) and follow us on Twitter.

© 2023 Couchbase. All rights reserved.